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EXAMINER				
CANTELMO, GREGG				
ART UNIT		PAPER NUMBER		
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03/21/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/791,101

**Applicant(s)**

GOTTESFELD ET AL.

**Examiner**

Gregg Cantelmo

**Art Unit**

1795

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6, 12-14 and 26-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 12-14 and 26-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 27, 2007 has been entered.

### ***Response to Amendment***

2. In response to the amendment received December 27, 2007:
- a. Claims 1-6, 12-14 and 26-29 are pending;
  - b. The specification objections have been overcome in light of the amendment;
  - c. The prior art rejections of record have been overcome in light of the amendment. However the prior art is applied under new grounds of rejection necessitated by Applicant's amendment.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-6, 12-14 and 26-29 rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the fuel cell being conformable to

different desired shapes, does not reasonably provide enablement for being conformed to any desired shapes. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. The phrase "any desired shape" extends beyond the scope of the disclosed invention since it is held that the disclosed conformable fuel cell has inherent limitations regarding its conformability and is incapable of being formed into any desired shape. Thus the scope of the claims materially extends beyond that which the specification reasonably enables.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-6, 12-14 and 26-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. The claims recite that the fuel delivery means is a conformable fuel delivery means. However it is unclear as to what the conformable element of item (D) of the claims is actually referring to. A review of the specification indicates that the element associated with limitations defined in item (D) of the claims is the housing of the fuel cell and not the fuel delivery means (page 12). The fuel delivery means is not readily shown to provide the requisite compression but again would appear that such is provided by the housing within which the fuel cell is disposed (see page 12). The fuel delivery means instead appears to include external elements such as those recited on page 13, ll. 24-28

none of which are readily exemplary of a conformable fuel delivery means.

Therefore the claims are unclear as to whether the claimed conformable fuel delivery means are those fuel delivery systems recited by the specification (which are not conformable and not providing the requisite compression of claim 1) or instead is the fuel cell housing (which is described as conformable and does provide the requisite compression as claimed). Pending clarification, the claims have been interpreted to be the latter and that the conformable fuel delivery means of claim 1 which provides the compression of the fuel cell is directed to the fuel cell housing itself (support for which can be found on page 12 of the specification).

b. Claim 29 is unclear. The phrase "anode aspect of the current collector" is not clear. It may be that the phrase should be "anode aspect of the fuel cell" or "current collector coupled with the anode aspect of the membrane electrolyte". Clarification is requested.

***Claim Interpretation***

5. For clarification the term "conformable" has been interpreted in light of the specification (see page 11) which states:

"As used herein, when used to describe a fuel cell, a fuel cell array or a fuel cell system, "conformable" shall mean being fabricated in such a fashion as to generally conform to the contours of the desired application or being sufficiently pliable to allow the assembly to meet a variety of shapes or to change shape based on the form of the object to which it is attached. "

Therefore the final structure can be a rigid design with the housing (claimed conformable fuel delivery means) within which the fuel cell is disposed being rigid to the desired end shape of the fuel cell.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 2, 4, 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt in view of U.S. Patent Application Publication No. 2005/0048349 (Fannon).

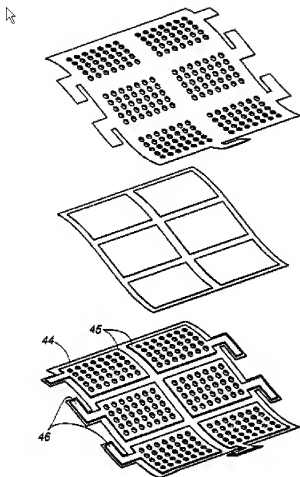
The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Pratt discloses a conformable fuel cell in Fig. 4, comprising: (A) a membrane electrolyte intimately interfacing with a catalyst layer along each of the membrane's major surfaces being a catalyzed membrane electrolyte, having an anode aspect and a cathode aspect, and which catalyzed membrane electrolyte is flexible (e.g., conformable to a desired shape); (B) diffusion layers sandwiching said catalyzed membrane

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electrolyte, said diffusion layers being comprised of materials that are conformable; (C) flexible current collectors coupled with each of said anode aspect and said cathode aspect of said membrane electrolyte; (D) fuel delivery means coupled with said anode aspect of said membrane electrolyte that delivers fuel substantially uniformly to said anode aspect while said fuel cell maintains said desired shape (Figs. 2-5); (E) electrical coupling 45 disposed across said anode aspect and said cathode aspect and having means for connection to an application device being powered by said fuel cell (as applied to claim 1).





**FIG. 4**

Regarding the conformable fuel delivery means:

The housing shown in Figs. 3 and 4 is constructed and conformed to a desired contour, in this case a planar contour. This interpretation is a reasonable interpretation in light of the Applications own definition of the term conformable (see page 11, ll. 15-19 of the specification.

The current collectors 45 at each of said anode aspect and said cathode aspect apply "adequate compression" effectively over the active area of the membrane electrolyte of each cell (Fig. 4 as applied to claim 2)

The conformable fuel cell includes a degree of water management therein and absent any definition of the term "effective water management" is broadly held to be exemplary of the claimed "effective water management" (see col. 3, ll. 25-30 as applied to claim 4).

The fuel is at least one of a vapor, gel, liquid or combination thereof and by example is hydrogen gas (sentence bridging columns 4 and 5 as applied to claim 5).

The fuel cell is planar and thus can conform with at least an exterior housing of an application device (as applied to claim 12).

The difference between claim 1 and Pratt is that Pratt does not expressly teach that the conformable fuel delivery means (conformable housing) maintains high compression along the active surfaces of the fuel cell (claim 1).

However the concept of maintaining a high degree of compression between fuel cell elements in a fuel cell array would have been well within the skill of the ordinary worker in the art and an obvious modification to the teachings of Fannon.

Fannon discloses a fuel cell wherein a thin fuel cell array is disposed in the same molded housing as recited and disclosed in the instant application (see figs of Fannon). The frame assembly of Fannon is shown to provide requisite compression of the fuel cell array disposed within the housing.

The fuel cell is planar and thus can conform with at least an exterior housing of an application device (as applied to claim 12).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Pratt by selecting the housing of Fannon since it would have provided a housing having a tight, secured seal which eliminated the need for gasketing while further providing compression to the fuel cells disposed within the housing.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt in view of Fannon as applied to claim 1 above and further in view of U.S. Patent No. 6,045,575 (Rosen).

The teachings of claim 1 have been discussed above and are incorporated herein.

The difference between claim 13 and Pratt is that Pratt does not teach of mechanically attaching the fuel cell to an article of clothing.

Rosen discloses an article of clothing wherein a fuel cell is mechanically attached to the article to power the electronic light array disposed on the article (Figs. 1a-1c; col. 3, ll. 1-5; col. 6, ll. 1-10).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Pratt by mechanically fastening the fuel cell to an article of clothing which requires a power source as taught by Rosen since the combination reasonably would lead one of ordinary skill in the art to

arrive at this combination and since the selection of the fuel cell system of Pratt to a particular load is relative to the intended use of the fuel cell.

8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt in view of Fannon as applied to claim 1 above and further in view of either JP 02-234358 (JP '358) or U.S. Patent No. 6,268,077 (Kelley).

The teachings of claim 1 have been discussed above and are incorporated herein.

The difference between claim 14 and Pratt is that Pratt does not teach of providing fuel to the fuel cell from a detachable conduit that connects to the anode side of the fuel cell.

JP '358 discloses providing a detachable conduit that connects to the anode side of the fuel cell (abstract and Figs. 1, 6 and 7). Kelley discloses a similar configuration wherein fuel is provided to the anode via a fuel cartridge (Figs. 1 and 3)

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Pratt by providing a detachable conduit that connects to the anode side of the fuel cell as taught by either JP '358 is that it would have provided a way to provide fuel to the fuel cell and to permit replacing the fuel or introducing additional fuel to the fuel cell system as needed. In addition has become well known in the art to employ fuel cartridges or cassettes to a fuel cell having a receiving conduit therein in portable electronic devices so as to provide a superior power source to the portable electronic devices while providing a way to re-fuel these power sources when needed.

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt in view of Fannon as applied to claim 2 above and further in view of U.S. Patent Application Publication No. 2001/0041281 (Wilkinson).

The teachings of claim 1 have been discussed above and are incorporated herein.

While not expressly recited, the fuel cell system of Pratt requires an inherent degree of compressive force therein in order to impart the requisite physical contact between the various layers in the fuel cell so as to provide for the conductive properties of the fuel cell itself. In addition, Fannon teaches that the housing imparts requisite compression to the fuel cell array disposed therein (discussed above).

The difference between claim 3 and Pratt is that Pratt does not teach of compressing the active area at a pressure which is equal to or greater than about 100 psi.

Wilkinson teaches that a fuel cell assembly is typically compressed (for example, at about 70 psi overall) to ensure good electrical contact between the plates and the electrodes, in addition to good sealing between fuel cell components.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Pratt by selecting the pressure of compression to be equal to or greater than about 100 psi since it would have imparted sufficient compression to the layers in the fuel cell and ensured good electrical contact between the plates and the electrodes, in addition to good sealing between fuel cell components. Generally, differences in ranges will not support the

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patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

10. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt in view of Fannon as applied to claim 1 above and further in view of U.S. Patent No. 4,973,531 (Zaima).

The teachings of claim 1 have been discussed above and are incorporated herein.

The difference between claim 27 and Pratt is that Pratt does not teach of providing a material which expands to impart compression to the fuel cell as recited in claim 6.

Zaima teaches that it is known to incorporate additional dedicated fuel cell compression layers which, in impart compression in response to temperature elevation in the fuel cell (see prior art claim 1).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Pratt by using the compression element such as that taught/suggested by Zaima since it would have improved the compression of the stack during operation and maintained a high degree of electrical conductivity between adjacent layers in the fuel cell.

11. Claims 3 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt in view of Fannon as applied to claims 1 and 2 above and further in view of U.S. Patent Application Publication No. 2002/0071984 (Dristy).

The teachings of claim 1 have been discussed above and are incorporated herein.

The difference between claim 3 and 27 and Pratt is that Pratt does not teach of compressing the active area at a pressure which is equal to or greater than about 100 psi (claim 3) or of providing a material which expands to impart compression to the fuel cell as recited in claim 27.

Dristy discloses providing a porous compressive element 64 which withstands and imparts a minimum compressive force of 100 psi to a polymer electrolyte fuel cell (paragraphs 43-46 as applied to both claims 3 and 27).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Pratt by selecting the pressure of compression to be equal to or greater than about 100 psi since it would have imparted sufficient compression to the layers in the fuel cell and ensured good electrical contact between the plates and the electrodes, in addition to good sealing between fuel cell components. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). Applied to claim 3.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Pratt by using the compression element such as that taught/suggested by Dristy since it would have improved the compression of the stack during operation and maintained a high degree of electrical conductivity between adjacent layers in the fuel cell. Applied to claim 27.

12. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt in view of Fannon as applied to claim 1 above and further in view of U.S. Patent No. 7,255,947 (Beccerra).

The teachings of claim 1 have been discussed above and are incorporated herein.

The difference between claims 28 and 29 and Pratt are that Pratt does not teach of the fuel delivery means comprising a layer of gelled fuel (claim 28) or of the fuel delivery means being affixed to the anode aspect of the fuel cell (claim 29).

Beccerra teaches of providing a layer of gelled fuel to the anode side of the fuel cell (Fig. 3 and col. 11, ll. 25-50 as applied to claim 28) and further teaches of disposing the fuel delivery means onto the frame housing of the fuel cell (as applied to claim 29).

This arrangement provides improved flow of methanol from the fuel source to the fuel cell and prevents water from migrating into the fuel cartridge (col. 11, ll. 25-50).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Pratt by using the gelled fuel delivery system of Beccerra since it would have improved flow of methanol from the fuel source to the fuel cell and prevents water from migrating into the fuel cartridge.



***Response to Arguments***

13. Applicant's arguments with respect to claims 1-6, 12-14 and 26-29 have been considered but are moot in view of the new ground(s) of rejection.

***Allowable Subject Matter***

14. Claims 6 and 26 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Upon further consideration none of the prior art of record appear to reasonably teach or suggest the dedicated layer of material which substantially expands upon either hydration or upon exposure to fuel to impart the compression.

While a heat responsive expanding material is known in the art for imparting compression, as discussed in the prior art identified above, the prior art does not reasonably teach or suggest the alternative responsive layers of either of claims 6 and 26 and such alternative (fluid responsive to impart compression) would not have been readily obvious from the teachings of a heat responsive compression layer.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:30-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gregg Cantelmo/

Primary Examiner, Art Unit 1795